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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/047,609	01/15/2002	Lothar Kugler	01-778	5746

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EXAMINER

SCOTT JR, LEON

ART UNIT

PAPER NUMBER

2828

DATE MAILED: 09/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/047,609	KUGLER, LOTHAR
	Examiner Leon Scott, Jr.	Art Unit 2828

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on _____.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-19 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
 5) Claim(s) ____ is/are allowed.
 6) Claim(s) 1-11,14-16,18 and 19 is/are rejected.
 7) Claim(s) 12,13 and 17 is/are objected to.
 8) Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on ____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 11) The proposed drawing correction filed on ____ is: a) approved b) disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.
 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) The translation of the foreign language provisional application has been received.
 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) Notice of References Cited (PTO-892)
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
 3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
 4) Interview Summary (PTO-413) Paper No(s) _____.
 5) Notice of Informal Patent Application (PTO-152)
 6) Other: _____



The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-11,14-16,18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mansell (3,731,992) when considered with Marmo et al (4,740,276).

Mansell (3,731,992) discloses a liquid cooled laser mirror having a mirror structure and a cover, a plurality of spiral grooves are located within the mirror structure while entrance and exit ports are located within the cover. Liquid enters through the cover entrance ports, circulates through the spiral grooves, and exits through the cover exit ports thereby cooling the mirror (see figs. 1 and 2).

Marmo et al (4,740,276) discloses: an electroforming method for making a cooled segmented aperture (SAM) mirror for use with high energy laser irradiation by electroforming, and depending upon the application, bare nickel surfaces may be used or the surface reflectivity may be enhanced through additional electrodeposited optical coatings.

Given the teachings of the references: Reflection-enhancing coatings are well known in the art for their use in laser systems,

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as evidenced by the references to: Kleinschmidt et al (2002/0186741), Durkin et al (5,696,786), Hughes (4,190,327); thus, the Examiner takes Official Notice that it would be obvious to use such coatings in the spiral grooved liquid cooled laser mirror of Mansell in a variety of locations to include the mirror cover to thereby form a cooled reflection-enhanced mirror surface. Applicants device is obvious. Further given the teachings of Marmo et al, it would be obvious that one of ordinary skill in the art would be motivated to use: bare nickel surfaces or to enhance the surface reflectivity of: the fluid duct(s), the mirror body or the cover by using additional electrodeposited nickel optical coatings. Claims 1,18 and 19 are obvious.

As to claims 2 and 8, Mansell discloses that: The mirror structure (12) has a reflective surface (16) on one side thereof and is made of any suitable reflecting material such as a highly polished metal. Further copper is a highly polished metal and it would obvious to use it as a reflection enhancing mirror. Claims 2 and 8 are obvious.

As to claim 3, Mansell discloses that: opposite reflective surface (16) are a plurality of spiral grooves (18 (A-F)) positioned within the structure (12) by any suitable method such as machining, terminating at a central manifold (19). Cover (14) is mounted within a recessed portion (20) of mirror structure (12) and has a plurality of ports (22 (A-F)) therein (see figs. 1 and 2). Claim 3 is obvious.

As to claims 4,5 and 7; Marmo et al discloses that: a cooled segmented aperture (SAM) mirror in which bare nickel surfaces may be used or to enhance the surface reflectivity additional electrodeposited optical coatings may be used. Thus it would be obvious to use: nickel plated fluid ducts (in claim 4); a nickel plated main mirror body (in claims 5 and 7)). Claims 4,5 and 7 are obvious.

As to claim 11, when the refection-enhancing mirror surface is formed represents a design modification which is viewed as being inherent in the device of Mansell; claim 11 is obvious.

As to claim 14, Mansell discloses that: the cooling device is provided in the main mirror body since the spiral grooves are located within the mirror structure. Claim 14 is obvious.

As to claims 15 and 16, it is known in the art that depending upon the desired result or intended many active laser rods can be used as the active medium to include Nd:YAG laser rods which will produce the recited wavelengths, as evidenced by the reference to Durkin et al (5,696,786) or any laser which uses an active medium that produces wavelengths of 10-11 micrometers; thus, the Examiner takes Official Notice that it would be obvious to use a rod laser medium that produces wavelengths of 10-11 micrometers as the active medium. Claims 15 and 16 are obvious.

Claims 6,9 and 10 merely recite design modifications which lacking some claimed suggestion to distinguish how they support novelty are obvious.

Claims 12,13 and 17 are objected to as depending from rejected claims.

Kleinschmidt et al (2002/0186741) discloses an optical element having a reflection enhancing dielectric coating.

Durkin et al (5,696,786) discloses a rod crystal, whose pump-oriented facet is treated with a reflection-enhancing coating (i.e. highly reflecting, HR) for the laser wavelength and the opposing facet is treated with a reflection-reducing coating (i.e. highly transmitting, HT) for the wavelength.

Hughes (4,190,327) discloses a liquid laser mirror having a multilayer dielectric coating between said optical flat and said working liquid for enhancing reflection.

Takada (2002/0027932) is cited for its teaching of a laser rod having both end faces of a Nd:YAG crystal applied with an AR (anti reflective) coating for enhancing transmittance

Asami (2002/0024977) is cited for its teaching of a semiconductor laser having one end surface covered with an antireflection coating and enhancing the flatness of an optical output

Ishimoto et al (2001/0028477) is cited for its teaching that to avoid reduction of light-collecting efficiency a reflection enhancing film may be disposed on said reflective optional member or a reflection preventive film may be disposed on the end face of a light guiding sheet-formed member.

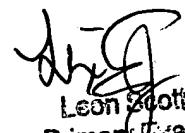
Oyama (2001/0053017) is cited for its teaching of a coating material such as an antireflection film, a reflection enhancing film provided on the surfaces of lenses and mirrors.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leon Scott, Jr. whose telephone number is 703-308-4884. The examiner can normally be reached on Monday - Friday, 6:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul P. Ip can be reached on (703)308-3098. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7721 for regular communications and 703-308-2864 for After Final communications.

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**Any inquiry of a general nature or relating to the status of
this application or proceeding should be directed to the
receptionist whose telephone number is 703-306-3431.**



Leon Scott, Jr.
Primary Examiner

**Leon Scott, Jr.
Primary Examiner
Art Unit 2828**

lsjr

September 11, 2003